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मानक

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IS 13257 (1992): Ring type joint gasket and grooves for pipe flanges [MED 30: Gaskets and Packing]



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Indian Standard

**RING TYPE JOINT GASKETS AND GROOVES
FOR PIPE FLANGES — SPECIFICATION**

UDC 621 - 762.4 : 621.643.412

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Gaskets and Packings Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

Ring type joint gaskets are used in petrochemical industries for very high temperature and pressure applications. The flanges used with these gaskets are grooved flanges. In the preparation of this draft standard, assistance has been drawn from API 6 'A well head equipment' and ANSI B16-20-1973 'Ring joint gaskets and grooves for steel pipe flanges', issued by the American Petroleum Institute and The American National Standard Institute respectively.

Indian Standard

RING TYPE JOINT GASKETS AND GROOVES FOR PIPE FLANGES — SPECIFICATION

1 SCOPE

Covers ring type joint gaskets and grooves of various types giving materials, dimensions and their tolerances.

2 TYPE

The types of gaskets and grooves covered in this draft standard are R, RX and BX rings.

In the R type both Oval and Octagonal cross sections are covered.

2.1 The bottom of the groove in the flange shall be flat.

3 MATERIAL

Ring type joint gaskets shall be produced from material to suit the operating conditions.

Ring type joint gaskets produced from the following materials shall conform to the hardness as indicated in Table 1.

Table 1 Hardness of Joint Gaskets
(Clause 3)

Material	Maximum Hardness in Brinell
Soft Iron	90
Low Carbon Steel	120
4-6% Chrome 1/2% Molybdenum Steel	130
Type 304 Steel	160
Type 316 Steel	160
Type 347 Steel	160
Type 410 Steel	170

4 DIMENSIONS AND TOLERANCES

Dimensions and tolerances of Ring type joint gaskets and grooves for R, RX and BX flange

connections shall be as given in Tables 2, 3, and 4, respectively.

The bottom of the groove shall be flat to ensure the interchangeability of oval and octagonal cross section gaskets.

5 FINISH

The contact surfaces of the Ring type joint gaskets and grooves shall have the following surface finish.

5.1 All 23° surfaces on Type R and RX gaskets shall have a surface finish no rougher than 63 RMS.

5.2 All round faces of the type R octagonal cross section gasket shall have a finish no rougher than 63 RMS.

5.3 All 23° surfaces on type BX gaskets shall have a surface finish no rougher than 32 RMS.

6 IDENTIFICATION MARKING

6.1 The edge of each Ring type joint flange shall be marked with the Ring type followed by Ring number and material code as shown in Table 5.

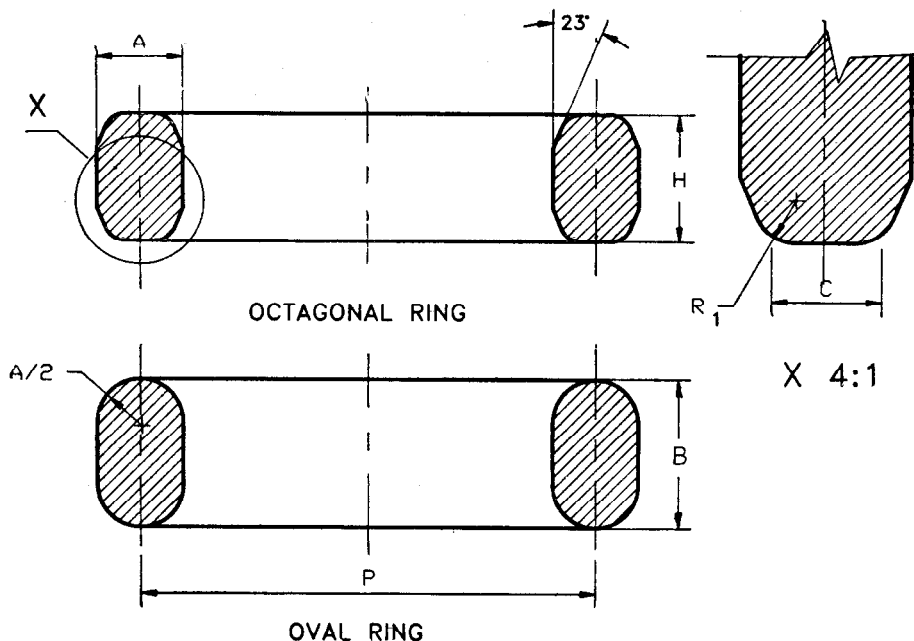
6.2 The outer surface of the Ring type joint gasket shall carry the marking of the Ring type followed by the Ring number and material code as shown in Table 5.

8 COATINGS AND PLATINGS

Coatings and platings are given to protect the surface of the Ring Type Joint gaskets and the thickness shall not be more than 0.013 mm, Maximum.

Table 2 Dimensions of Type R Ring Joint Gaskets and Grooves
(Clause 4)

All dimensions in millimetres.

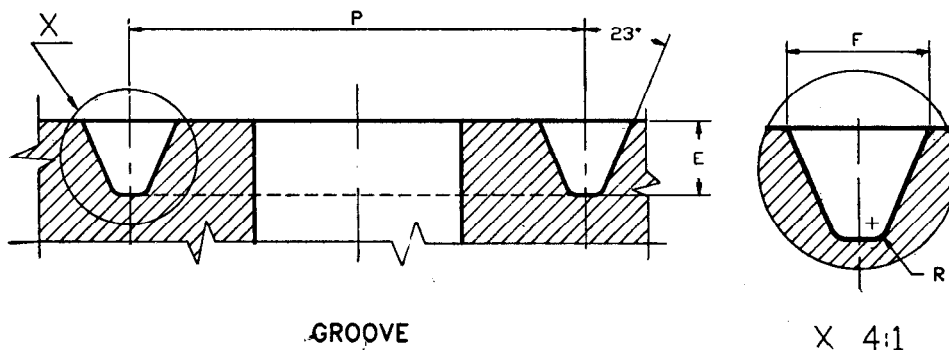


Radius R_1 : 1.6 mm for ring widths 22 mm and smaller;
2.4 mm for widths 25.4 mm and larger

Ring Tolerance, mm

P (average pitch diameter of ring)	$= \pm 0.18$
A (width of ring)	$= \pm 0.2$
B and H (height of ring)	$= + 1.2, - 0.4$
Uniformity of height ± 0.4 mm of average height	
C (width of flat of octagonal ring)	$= \pm 0.2$
23° (angle)	$= \pm 1/2^\circ$
R_1 (radius of ring)	$= \pm 0.4$

*Variation in height throughout the entire circumference of any given ring shall not exceed 0.4 mm within these tolerances.



Groove tolerances, mm

E (depth)	$+0.4$ -0
F (width)	± 0.2
P (pitch diameter)	± 0.13
R (radius at bottom), Max	
23° (angle)	$\pm 1/2^\circ$

Table 2 (Continued)

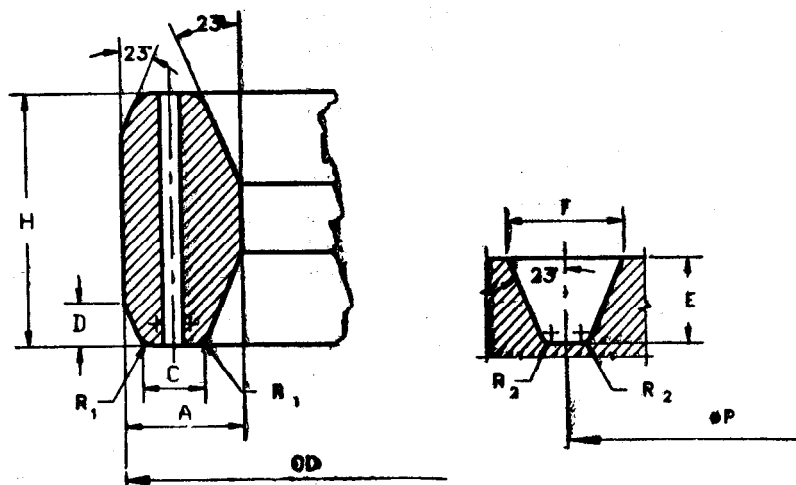
IS 13257 : 1992

Ring No.	P	A	B	H	C	E	F	R
R 11	34.1	6.4	11.1	9.5	4.3	5.6	7.1	0.8
R 12	39.6	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 13	42.8	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 14	44.4	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 15	47.6	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 16	50.8	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 17	57.2	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 18	58.7	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 19	65.0	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 20	68.2	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 21	72.2	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 22	82.6	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 23	82.6	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 24	95.4	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 25	101.6	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 26	101.6	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 27	108.0	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 28	111.1	12.7	19.2	17.5	8.7	9.5	13.5	1.6
R 29	114.3	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 30	117.6	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 31	123.8	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 32	127.0	12.7	19.2	17.5	8.7	9.5	13.5	1.6
R 33	131.7	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 34	131.7	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 35	136.4	11.1	17.4	15.9	6.9	7.9	11.9	0.8
R 36	149.2	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 37	149.2	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 38	157.1	16.0	22.2	20.6	10.3	11.1	16.7	1.6
R 39	161.8	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 40	166.5	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 41	181.0	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 42	190.5	19.2	25.4	23.8	12.3	12.7	19.8	1.6
R 43	193.8	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 44	193.8	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 45	211.2	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 46	211.2	12.7	19.2	17.5	8.7	9.5	13.5	1.6
R 47	228.6	19.2	25.4	23.8	12.3	12.7	19.8	1.6
R 48	247.8	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 49	270.0	11.1	17.4	15.9	7.9	7.9	11.9	0.8
R 50	270.0	16.0	22.2	20.6	10.3	11.1	16.7	1.6
R 51	279.4	22.2	28.6	27.0	14.7	14.3	23.0	1.6
R 52	304.8	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 53	324.0	11.1	17.5	15.9	7.9	7.9	11.9	0.8
R 54	324.0	16.0	22.2	20.6	10.3	11.1	16.7	1.6
R 55	342.9	28.6	35.6	34.9	19.8	17.5	30.2	2.4
R 56	381.0	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 57	381.0	11.1	17.5	15.9	7.9	7.9	11.9	0.8
R 58	381.0	22.2	28.6	27.0	14.7	14.3	23.0	1.6
R 59	397.0	8.0	14.3	12.7	5.1	6.4	8.7	0.8
R 60	406.4	31.8	39.7	38.1	22.2	17.5	33.3	2.4

Ring No.	P	A	B	H	C	E	F	R
R 61	419.1	11.1	17.5	15.9	7.6	7.9	11.9	0.8
R 62	419.1	15.9	22.2	20.6	10.4	11.1	16.7	1.6
R 63	419.1	25.4	33.3	31.8	17.1	15.9	27.0	2.4
R 64	454.0	7.9	14.3	12.7	5.2	6.4	8.7	0.8
R 65	469.9	11.1	17.5	15.9	7.6	7.9	11.9	0.8
R 66	469.9	15.9	22.2	20.6	10.4	11.1	16.7	1.6
R 67	469.9	28.6	36.5	34.9	19.8	17.5	30.2	2.4
R 68	517.5	7.9	14.3	12.7	5.2	6.4	8.7	0.8
R 69	533.4	11.1	17.5	15.9	7.6	7.9	12.3	0.8
R 70	533.4	19.0	25.4	23.8	12.3	12.7	19.8	1.4
R 71	533.4	28.6	36.5	34.9	19.8	17.5	30.2	2.8
R 72	558.8	7.9	14.3	12.7	5.2	6.4	8.7	0.6
R 73	584.2	12.7	19.0	17.5	8.7	9.5	13.5	1.6
R 74	584.2	19.0	25.4	23.8	12.3	12.7	19.8	1.6
R 75	584.2	31.8	39.7	38.1	22.2	17.5	33.3	2.4
R 76	673.1	7.9	14.3	12.7	5.2	6.4	8.7	0.8
R 77	692.2	15.9	22.2	20.6	10.4	11.1	16.7	1.6
R 78	692.2	25.4	33.3	31.8	17.1	15.0	27.0	2.4
R 79	692.2	34.9	44.4	41.3	24.8	20.6	36.5	2.4
R 80	616.0	7.9	—	12.7	5.2	6.4	8.7	0.8
R 81	635.0	14.3	—	19.0	9.5	11.1	15.1	1.6
R 82	57.2	11.1	—	15.9	7.6	7.9	11.9	0.8
R 83	63.5	11.1	—	15.9	7.6	7.9	11.9	0.8
R 84	63.5	11.1	—	15.9	7.6	7.9	11.9	1.6
R 85	79.4	12.7	—	17.5	8.7	9.5	13.5	1.6
R 86	90.5	15.9	—	20.6	10.4	11.1	16.7	1.6
R 87	100.0	15.9	—	20.6	10.4	11.1	16.7	1.6
R 88	123.8	19.0	—	23.8	12.3	12.7	19.8	1.6
R 89	114.3	19.0	—	23.8	12.3	12.7	19.8	1.6
R 90	155.6	22.2	—	27.0	14.8	14.3	23.0	1.6
R 91	260.4	31.8	—	38.1	22.2	17.5	33.3	2.4
R 92	228.6	11.1	17.5	15.9	7.6	7.9	11.9	0.
R 93	749.3	19.0	—	23.8	12.3	12.7	10.8	1.
R 94	800.1	19.0	—	23.8	12.3	12.7	19.8	1.6
R 95	857.2	19.0	—	23.8	12.3	12.7	19.8	1.6
R 96	914.4	22.2	—	27.0	14.8	14.3	23.0	1.6
R 97	965.2	22.2	—	27.0	14.8	14.3	23.0	1.6
R 98	1 022.4	22.2	—	27.0	14.8	14.3	23.0	1.6
R 99	235.0	11.1	—	15.9	7.6	7.9	11.9	0.8
R 100	749.3	28.6	—	34.9	19.8	17.5	30.2	2.4
R 101	800.1	31.8	—	38.1	22.2	17.5	30.2	2.4
R 102	857.2	31.8	—	38.1	22.2	17.5	33.3	2.4
R 103	914.4	31.8	—	38.1	22.2	17.5	33.3	2.4
R 104	865.2	34.9	—	41.3	24.8	20.6	36.5	2.4
R 105	1 022.4	34.9	—	41.3	24.8	20.6	36.5	2.4

Table 3 Dimensions of Type RX Pressure Energized Ring Gaskets
(Clause 4)

All dimensions in millimetres.



TOLERANCES

<i>A*</i>	(Width of ring).....	+ 0.008, - 0.000	+ 0.2, - 0.0
<i>C</i>	(Width of flat).....	+ 0.006, - 0.000	+ 0.16, - 0.0
<i>D</i>	(Height of chamber)	+ 0.000, - 0.03	+ 0.0, - 0.8
<i>E</i>	(depth of groove).....	+ 0.02, - 0	+ 0.5, - 0.0
<i>F</i>	(width of groove).....	+ 0.009 ± 0.2	
<i>H*</i>	(height of ring).....	+ 0.008, - 0.000	+ 0.2, - 0.0
<i>OD</i>	(OD of ring).....	+ 0.020, - 0.000	+ 0.2, - 0.0
<i>P</i>	(average pitch diameter of groove)...	± 0.005 ± 0.12	
<i>R₁</i>	(radius in ring).....	+ 0.02	+ 0.5
<i>R₂</i>	(radius in groove).....	<i>Max</i> ± 0.5	
<i>S</i>	Approximate distance between Mated , up Flanges		
23°	(angle).....	± 1/2%	

*A plus tolerance of 0.2 mm for width A and height H is permitted, provided the variation in width or height of any ring does not exceed 0.1 mm throughout its entire circumference.

NOTE — The pressure passage hole illustrated in the RX ring cross section in rings RX-82 to RX-91 only. Centerline of hole shall be located at midpoint of dimension C . Hole diameter shall be 1.6 mm for rings RX-82 to RX-85 2.4 mm for rings RX-86 and RX-87 and 3.2 mm for rings RX-88 to RX-91.

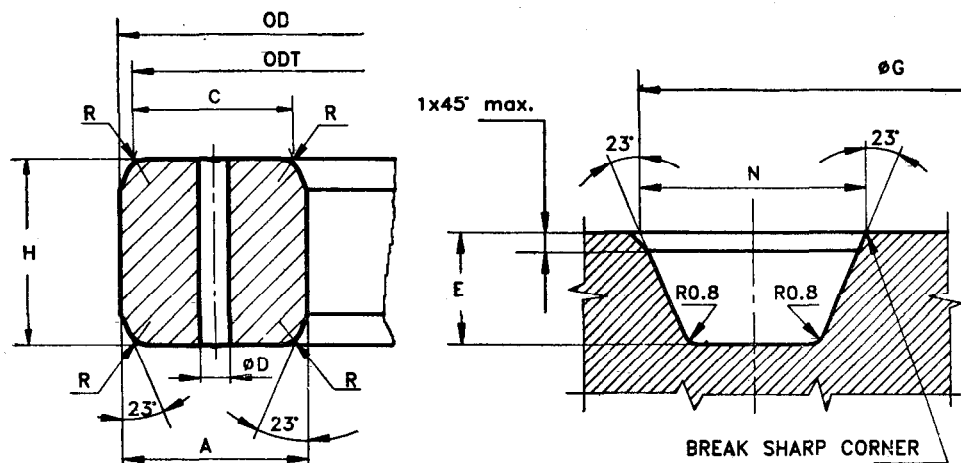
Ring No.	P	OD	A	C	D	H	R_1	E	F	R_2	S
RX 20	68.3	76.2	8.7	4.6	3.2	19.0	1.6	6.4	8.7	0.79	9.9
RX 23	82.6	93.3	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 24	95.3	106.0	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 25	101.6	109.6	8.7	4.6	3.2	19.0	1.6	6.4	8.7	0.79	—
RX 26	101.6	111.9	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9

Table 3 (Concluded)

Ring No.	P	OD	A	C	D	H	R ₁	E	F	R ₂	S
RX 27	108.0	118.3	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 31	123.8	134.5	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 35	149.2	147.8	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 37	149.2	159.9	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 39	161.9	172.6	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 41	181.0	191.7	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 44	193.7	204.4	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 45	211.2	221.8	13.5	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 46	211.2	222.3	13.5	6.7	4.8	28.6	1.6	9.5	13.5	1.60	11.9
RX 47	228.6	245.3	19.8	10.3	6.8	41.3	2.4	12.7	19.8	1.60	11.6
RX 40	269.5	280.6	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 50	269.9	283.4	16.7	8.5	5.2	31.7	1.6	11.1	16.7	1.60	11.9
RX 53	323.9	334.6	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 54	323.9	337.3	16.7	8.5	5.2	31.7	1.6	11.1	16.7	1.60	11.9
RX 57	381.0	391.7	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 63	419.1	441.7	27.0	14.7	8.4	50.8	2.4	15.9	27.0	2.4	21.4
RX 65	469.9	480.6	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 66	469.9	483.4	16.7	8.5	5.2	31.7	1.6	11.1	16.7	1.6	11.9
RX 69	533.4	544.1	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 70	533.4	550.1	19.8	10.3	6.8	41.3	2.4	12.7	19.8	1.6	18.2
RX 73	584.2	596.1	13.5	6.7	5.1	31.7	1.6	9.5	13.5	1.6	15.1
RX 74	584.2	600.9	19.8	10.3	6.8	41.3	2.4	12.7	19.8	1.6	18.2
RX 82	57.2	67.9	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 84	63.5	74.2	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 85	79.4	90.1	13.5	6.7	4.1	25.4	1.6	9.5	13.5	1.6	9.5
RX 86	90.5	103.6	15.0	8.5	4.8	28.6	1.6	11.1	16.7	1.6	9.5
RX 87	100.0	113.1	15.0	8.5	4.8	28.6	1.6	11.1	16.7	1.6	9.5
RX 88	123.8	139.3	17.5	10.3	5.2	31.7	1.6	12.7	19.8	1.6	9.5
RX 89	114.3	129.8	18.3	10.3	5.2	31.7	1.6	12.7	19.8	1.6	9.5
RX 90	155.6	174.6	19.8	12.1	7.4	44.4	2.4	14.3	23.0	1.6	18.2
RX 91	260.4	286.9	35.2	19.8	7.5	45.2	2.4	17.5	33.3	2.4	19.0
RX 99	235.0	245.7	11.9	6.4	4.1	25.4	1.6	7.9	11.9	0.79	11.9
RX 201	46.1	51.5	5.7	3.2	1.5	11.3	0.5***	4.0	5.6	0.79	—
RX 205	57.2	62.3	5.6	3.1	1.9**	11.1	0.5***	4.0	5.6	0.4	—
RX 210	88.9	97.6	9.5	5.5	3.2**	19.0	0.79***	6.4	9.5	0.79	—
RX 215	130.2	140.9	11.9	5.4	4.1**	25.4	1.6***	7.9	11.9	0.79	—

Table 4 Dimensions of Type BX Pressure Energized Ring Gaskets
(Clause 4)

All dimensions in millimetres.



TOLERANCES

<i>A</i> *	(width of ring)...+ 0.008, - 0.000 + 0.2, - 0.0
<i>C</i>	(width of flat)...+ 0.006, - 0.000 + 0.16, - 0.0
<i>D</i>	(hole size).....none
<i>E</i>	(depth of groove)...+ 0.02, - 0 + 0.5, - 0.0
<i>G</i>	(OD of groove)...+ 0.004, - 0.000 + 0.1, - 0.0
<i>H</i> *	(height of ring)...+ 0.008, - 0.000 + 0.2, - 0.0
<i>N</i>	(width of groove)...+ 0.004, - 0.000 + 0.1, - 0.0
<i>OD</i>	(OD of ring)...+ 0.000, - 0.006 + 0.0, - 0.16
<i>ODT</i>	(OD of flat)...± 0.002 ± 0.05
<i>R</i>	(radius in ring)...see note
<i>V</i>	Nominal value size
23°	(angle)...± 1/4°

*A plus tolerance of 0.2 mm for width *A* and height *H* is permitted. Provided the variation in width or height of any ring does not exceed 0.1 mm throughout its entire circumference.

NOTE — Radius 'R' shall be 8 to 12 percent of the gasket height 'H'.

Ring No.	<i>V</i>	<i>OD</i>	<i>H</i>	<i>A</i>	<i>ODT</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>G</i>	<i>N</i>
BX 150	42.9	72.2	9.3	9.3	70.9	8.0	1.5	5.6	73.5	11.4
BX 151	46.0	76.4	9.6	9.6	75.0	8.3	1.5	5.6	77.8	11.8
BX 152	52.4	84.7	10.2	10.2	83.2	8.9	1.5	5.8	86.2	12.6
BX 153	65.1	100.9	11.4	11.4	99.3	10.0	1.5	6.9	102.8	14.1
BX 154	77.8	116.8	12.4	12.4	115.1	10.6	1.5	7.6	119.0	15.4
BX 155	103.2	148.0	14.2	14.2	145.9	12.2	1.5	8.4	150.6	17.7
BX 156	179.4	237.9	18.6	18.6	235.3	16.0	3.0	11.2	241.8	23.4
BX 157	228.6	294.5	21.0	21.0	291.5	18.0	3.0	12.7	299.1	26.4
BX 158	279.4	352.0	23.1	23.1	348.8	20.0	3.0	14.2	357.2	29.2
BX 159	346.2	426.7	25.7	25.7	423.1	22.1	3.0	15.7	432.6	32.5
BX 160	346.2	402.6	23.8	13.7	399.2	10.4	3.0	14.2	408.0	20.0
BX 161	422.4	491.4	28.1	16.2	487.5	12.2	3.0	17.0	497.9	23.6
BX 162	422.4	475.5	14.2	14.2	473.5	12.2	1.5	8.4	478.3	17.9
BX 163	476.2	556.2	30.1	17.4	551.9	13.1	3.0	18.3	563.5	25.5
BX 164	476.2	570.6	30.1	24.6	566.3	20.3	3.0	18.3	577.9	32.8
BX 165	539.8	624.7	32.0	18.5	620.2	14.0	3.0	19.1	632.6	27.2
BX 166	539.8	640.0	32.0	26.1	635.5	21.6	3.0	19.1	647.9	34.9
BX 167	679.4	759.0	35.9	13.1	754.3	8.0	1.5	21.3	768.3	22.9
BX 168	679.4	767.0	35.9	16.1	760.2	11.0	1.5	21.3	774.2	25.9
BX 169	130.2	173.5	15.8	12.9	171.3	10.7	1.5	9.7	176.7	16.9
BX 170	228.6	218.0	14.2	14.2	216.0	12.2	1.5	8.4	270.9	17.9
BX 171	279.4	267.4	14.2	14.2	265.4	12.2	1.5	8.4	270.3	17.9
BX 172	346.2	333.1	14.2	14.2	331.1	12.2	1.5	8.4	335.9	17.9

Table 5 Marking of Ring Type Joint Gaskets
(Clause 6.2)

Ring Type Gasket Material	Material Code	Marking Example
Soft Iron	D	R60D
Low Carbon Steel	S	R60S
4-6 percent Chrome 1/2 percent Molybdenum Steel	F5	R60F5
Type 304 Steel	S304	R60S304
Type 316 Steel	S316	R60S316
Type 347 Steel	S347	R60S347
Type 410 Steel	S410	R60S410

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